# STATE OF UTAH

## UNDERGROUND INJECTION CONTROL PROGRAM

## CLASS V
## INJECTION WELL

PERMIT APPLICATION PACKAGE

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# PART I

## GENERAL INSTRUCTIONS

The Underground Injection Control (UIC) Rules authorize the injection of fluids (UAC R317-7). The following instructions outline the procedures, documents, and information needed for a Class V well permit application.

1. The applicant shall submit an original Permit Application and a Technical Report. Both documents are to be submitted in triplicate to the:

   Utah Department of Environmental Quality
   Division of Water Quality
   288 North 1460 West
   P.O. Box 144870
   Salt Lake City, Utah 84114-4870

   ATTN: Ground Water Protection Section

   Telephone inquiries: (801) 538-6146

2. Signature on Application: The person who signs the application form will often be the applicant; when another person signs on behalf of the applicant, his/her title or relationship to the applicant should be shown in the space provided. In all cases, the person signing the form should be authorized to do so by the applicant. An application submitted by a corporation must be signed by a principal executive officer of at least the level of vice president or his duly authorized representative, if such representative is responsible for the overall operation of the facility from which the activity described in the form originates. In the case of a partnership or a sole proprietorship, the application must be signed by a general partner or the proprietor, respectively. In the case of a municipal, state, federal or other public facility, the application must be signed by either a principal executive officer, ranking elected official or other duly authorized employee. The Division shall require a person signing an application on behalf of an applicant to provide proof of authorization (40 CFR Part 144.32).

3. An application will not be processed until all required information of sufficient detail has been obtained. When an application is severely lacking in detail or the applicant fails to submit additionally requested information in a timely manner, the application may be returned.

4. An application which involves the injection of a fluid containing radioactive materials shall be accompanied by a letter or other instrument in writing from the Utah Division of Radiation Control, stating that either the applicant has a license from the Division of Radiation Control governing the disposal of radioactive materials; or that the applicant does not need a license. In the case of radioactive materials disposal, the Division of Radiation Control must receive a copy of the application for an injection permit. The copy should be mailed to:

Utah Department of Environmental Quality
Division of Radiation Control
168 North 1950 West
Salt Lake City, Utah 84114-4850

## PART II

## PROCEDURAL INFORMATION

The staff will review the application for completeness. During the completeness review, the applicant may be contacted for clarification or additional information. When all pertinent information is present, a notice that an application has been received may be given to other state agencies and local governmental entities interested in water quality control and industrial waste management. A draft permit that may include a Statement of Basis will be prepared by the Division and transmitted to the applicant for review. Comments from the applicant may result in changes to the draft permit, after concurrence by the Executive Secretary. After Executive Secretary approval, the draft permit will be subjected to public comment and/or a public hearing. In either case, a notice will be provided to inform the public that a draft permit has been prepared.

Requirements for the public notice include:

1. That a public notice be published for each draft permit, permit amendment, or permit renewal that has been prepared. The notice will appear within each county where the proposed facility or discharge is located and each county affected by the discharge.

2. The Executive Secretary will mail notice of the application to affected persons and certain governmental entities.

A public hearing will be scheduled regarding an application when requested by the Water Quality Board (Board), the Executive Secretary, the applicant, or any affected person within thirty (30) days following newspaper publication.

The Board may act upon a permit application, a draft permit, permit amendment, or renewal of a permit without holding a public hearing when:

1. Adequate public notice and comment period has been provided, including: (a) notice of the application has been mailed to persons possibly affected by the proposed permit; (b) notice has been published at least once in a newspaper, regularly published or circulated within each county where the proposed facility or discharge is located and in each county affected by the discharge; and

2. Within thirty (30) days following publication of the Board's notice the Executive Secretary, the applicant, or an affected person has not requested a public hearing; or

3. An application to amend a permit will result in an improvement of the quality of the fluid authorized to be injected and if the applicant does not seek to increase significantly the quantity of fluid to be injected or to change materially the pattern or place of injection.

After resolution of any public comment the Executive Secretary shall issue or deny the draft permit, permit amendment, or permit renewal. Within thirty (30) days of issuance, a copy of the permit or permit denial will be mailed to the applicant.

PART III

CLASS V INJECTION WELL

Permit Application

1. Type of Permit Application (check one)

   [ ] Initial Application

   [ ] Permit Renewal, Original Permit No. _____

   [ ] Permit Modification, Original Permit No. _____

2. Type of Permit (check one)

   [ ] Individual Well Permit

   [ ] Area Permit

3. Applicant (must be the operator if owner/operator are different):

   _____
   (Individual, Corporation or Other Legal Entity)

   Address: _____
   (Permanent Mailing Address)

   City:_____State:_____ Zip:_____

   Telephone Number: _____

4. Facility owner: _____

   _____
   (Individual, Corporation or Other Legal Entity)

   Address: _____
   (Permanent Mailing Address)

   City:_____State:_____ Zip:_____

   Telephone Number: _____

5. Facility status:Federal _____State _____ Private _____
Public _____ Other _____
(Indicate)

6. List those persons or firms authorized to act for the applicant during the processing of the permit application. Include a complete mailing address and telephone number:

7. List all activities presently conducted by this facility which require an environmental permit:

8. List all environmental permits or construction approvals received or applied for relevant to this facility or this location (do not include this permit application):

9. Type of operation(s) producing the proposed injectate (include appropriate SIC Codes):

10. Proposed Injection Operation

Facility name: _____

Facility mailing address: _____

Facility location: _____

Street address: _____

City: _____

County: _____ Lease: _____

No. of Wells* : _____

Township; Range; Section; and 1/4, 1/4 Section: _____

Latitude: _____ Longitude: _____

Survey: _____ Abstract: _____

* Location(s) of injection well(s) should be identified on all maps, including those maps required by the Technical Report.

11. Are the proposed injection well(s) located on Indian land? _____ Yes/No

12. Proposed Injection Program:

a. Source(s) and type(s) of injection fluid(s):

b. Type(s) of injection well(s) (borehole, drainfield, gravel filled pit, etc.):

c. Elevation of drill collar:

d. Total depth(s) of well(s) measured from the drill collar:

e. Depth(s) of screened interval(s) measured from the drill collar:

f. Wellhead locations: Well I.D. Surface or Subsurface?

g. Geologic name(s) of formation(s), member(s), or submember(s) of the lithologic unit(s) in which injection will occur. Include depth(s) from surface.

h. Proposed Annual Injection Volume (Acre-Feet):

Well ID: _____ Average: _____ Maximum: _____

i. Proposed Injection Rate (Gallons Per Minute):

Well ID: _____ Average: _____ Maximum: _____

j. Proposed Injection Pressure (PSI):

Well ID: _____ Average: _____ Maximum: _____

13. An application map or maps, depicting:

a. The approximate boundaries of the tract of land on which the injection well activity is or will be conducted.

b. The location of the injection well(s) as related to facility boundaries and to adjacent survey lines.

c. The general character of the areas adjacent to the place or places of injection such as residential, commercial, recreational, agricultural, undeveloped, etc.

d. The boundaries and ownership of tracts of land adjacent to the facility boundaries. Include, with the map a list containing the names and mailing addresses of the owners of the tracts of land adjacent to the facility boundaries keyed to the map.

14. Name(s) and address(es) of surface owner(s) [attach additional sheets if necessary]:

15. On an attached sheet(s), list the names and mailing addresses of persons or parties that may be effected by the injection operation; e.g. adjacent property owners, mineral lease owners, water right owners, nearby municipalities and other governmental bodies or installations.

16. The names and mailing addresses of persons identified as affected parties, were obtained from:

    (Source: City, County, School or Water District Records or Abstract Co.)

17. Provide a separate list of owners of mineral interests in the tract of land on which the well will be drilled and include a complete mailing address for each. Include other mineral interests that could be affected by contaminant movement over the life of the project.

18. Submit the Technical Report with Application.

19. Certification of submitted information.

_____ , _____
(Name of Company Official) (Title)

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature: _____ Date: _____

SUBSCRIBED AND SWORN to before me this _____ day of _____, 20_____.

My commission expires on the _____ day of _____, 20 _____.

_____
Notary Public in and for

(SEAL) _____ County, Utah

PART IV

TECHNICAL REPORT OUTLINE
FOR CLASS V
INJECTION WELL APPLICATIONS

Applicants should consult with Division staff prior to initiating a UIC Permit application for injection operations to review the information necessary for a Technical Report.

A Technical Report, prepared under the direction of a professional engineer or geologist, containing as a minimum the following information must be submitted as an attachment to the application. Adjustments in these requirements may be made by the technical staff upon a showing of good cause that the situation so warrants.

Items required for inclusion in the technical or engineering report are:

1. A map indicating the location {with name(s) or number(s)} of the proposed injection well(s) and all producing wells (oil, gas, geothermal, etc.), exploratory boreholes, injection wells, monitoring wells, abandoned wells, dry holes, surface bodies of water, springs, mines (surface and subsurface), quarries and water wells (drilled or dug) within the area of review. The area of review is defined as the area within a two (2) mile radius of the injection well (or project perimeter, for area permits), or a radius calculated per 40 CFR 146.6(a). Include any other artificial penetrations not noted. The map must show pertinent surface features including residences and roads. Faults (known or suspected) must be indicated. Only information of public record is required to be included on this map.

   Include a tabulation of well I.D.'s and types, well depth(s), water level(s), owner(s), chemical/physical analyses (if available) and other pertinent data keyed to the map. All water wells must be identified as to their use (i.e., public or private drinking water, livestock watering, irrigation, etc.).

2. On a map of appropriate scale, indicate the location of the public water supply well that is nearest the proposed injection well in an hydraulically down-gradient direction. Attach pertinent data on the well {see (1) above}.

3. A piezometric map of all ground water in the area (confined and unconfined) using information from wells near the proposed injection well(s). This map must also show the vertical and lateral limits of underground sources of drinking water (USDW's), i.e., total dissolved solids (TDS) are less than 10,000 milligrams/liter. Include the position of these sources relative to the injection formation, direction(s) of ground water flow and an estimate of average linear velocity for each ground water system present.

4. For those wells or boreholes, etc. noted in (1) above which penetrate the proposed injection zone, provide the following additional information:

   a. A tabulation of: operator; lessor; well I.D.; well type and construction data; date

drilled; distance from proposed injection well(s). In addition to this information, copies of available casing and cementing records shall be submitted including the appropriate State forms and cementing affidavits. Tabulation shall be keyed to map in (1) above.

b. A cross-section schematic of the well or borehole. See attached form.

5. Proposed corrective action plan for all wells, boreholes, etc. within the area of review which penetrate the injection zone but are not properly completed or plugged.

6. Description of local topography and geology pertinent to the injection operation. This information shall include but is not limited to:

a. A USGS topographic map (1:24,000 scale, if available), or other map if the topographic map is unavailable, extending two miles beyond the property boundary; depicting the proposed injection well(s), the property boundaries, the facility and its intake and discharge structures; any hazardous waste treatment, storage and disposal facilities; existing injection well(s); and wells, springs, surface water bodies and drinking water wells listed in public records or otherwise known.

b. Surface geologic map and cross-sections on a scale necessary to depict the local and regional geology of the area. Indicate the location of the injection well(s) on the geologic map.

c. Two cross-sections perpendicular to each other crossing at the proposed injection location. These cross-sections will include, at a minimum, all available log control, geologic units structure and lithology that occur between the surface and the lower confining bed below the injection zone. If a major structure exists below the injection zone, the sections will be projected to as deep as necessary to show the structure. All aquifers and their water quality must be identified, including the base of 3,000 mg/l and 10,000 mg/l TDS water. This cross-section will be to the necessary scale to detail the local geology at least within the area of review, and preferably for the area surrounding the injection operation.

d. Parameters of upper and lower confining strata (lithology, permeability, etc.) for all USDW's present and the injection zone.

e. Description of faulting and fracturing or lineations in the area (vertical stereo aerial photos with lineation interpretations are suggested). Pay special attention to faults and fractures that intersect USDW confining zones.

f. Depositional, structural and tectonic (seismic) history of the area including lithology and hydrologic properties of all units penetrated by the proposed well.

g. Structural contour map on top of the proposed injection zone.

h. Isopach map of the injection zone. (Between major confining zones.)

1) Isopach of permeable zone within injection zone.

2) If more than one zone is being requested, isopachs of each permeable zone.

7. Geohydrology - reservoir mechanics of injection interval (give sources of information):

a. Porosity, hydraulic conductivity, transmissivity and temperature.

b. Natural reservoir pressure (bottom-hole pressure) or hydrostatic head; fluid saturation, chemical and physical characteristics of formation, and formation fluids.

c. Location, extent, and effects of known or suspected faulting, fracturing and/or formation solution channels.

d. Proposed formation testing program to obtain an analysis of the chemical, physical, and radiological characteristics of the receiving formation. This information will be used to determine the compatibility of the formation with the proposed injectate.

e. Fracture gradient or formation breakdown pressure of injection zone and all confining beds.

8. Characteristics of injectate:

a. A detailed description of the chemical, physical, radiological and biological characteristics of the fluids to be injected. Complete chemical analyses of all inorganic constituents should be reported in ppm or mg/l. If organic fractions are present, all such constituents should be reported in ppm or mg/l, as individual percentages by weight, or in other appropriate terms. Give analysis of each individual fluid stream and its percentage of total injection volume. Data on the toxicity and degradability rates and levels are required on final composite injection stream.

b. Corrosion test on all facilities that will be in contact with the injection stream, including any long string casing.

c. The anticipated average and maximum rate of injection in gallons per minute and gallons per month. Estimate the yearly volume of injected fluid and the anticipated life of the project (show calculations).

9. Detailed outline of construction and completion of the proposed injection wells (all new materials required unless otherwise approved by the Executive Secretary):

a. Total well depth from wellhead and wellhead elevation.

b. Type of completion: perforation, open hole, screen, etc.

c. Type, size, weight, grade and setting depth of all casing strings (API standards). Indicate compatibility of casing material with proposed injectate.

d. Proposed cementing procedures and type of cements, including volumes, additives, slurry weight, etc. (Sufficient cement shall be used to circulate to the surface plus a minimum of 20% excess.) Submit service company recommendations along with studies to determine the suitability of the selected cements.

e. Cementing technique and equipment: guide shoe, float collar, plugs, baskets, DV tools, etc.

f. Proposed injection interval(s) and perforating or screen setting depths. This should include the interval(s) to be utilized initially and the entire zone required for future development.

g. Number and location of centralizers, wall scratchers, etc.

h. Size and type of tubing and proposed setting depth.

i. Size and type of tubing packer and proposed setting depth.

j. Diagrammatic sketches of well, wellhead facilities, and any annulus monitoring system.

k. Proposed well stimulation program, acidizing, hydraulic fracturing, etc.

l. Description of proposed injectivity tests (i.e., permeability, reservoir limits, reservoir types, etc.)

m. Proposed open hole and cased hole logging, bottom-hole testing, coring, etc. Minimum logging requirements will be set by technical staff.

10. Wellhead installations:

a. Description of pressure and volume monitoring systems for injection and annulus systems.

b. Description of filters including type, capacity and capability.

c. Description of injection pumps including type and capacity.

d. A schematic of the surface and subsurface construction details of the system (showing location of all flow lines and pre-injection system).

e. Detailed description of any pre-injection treatment process, including a flow diagram with each injection stream identified along with tank capacity and construction materials.

f. Plans for disposal of liquid, solid or semi-solid waste from the pre-injection treatment system.

g. Detailed plans and specifications of all wellhead-associated facilities.

1) The wellhead-associated facilities should be diked to totally contain spillage and control run-on and run-off.

2) The areas (including loading, unloading, tanks, pumps, and filters) within the wellhead dike should be lined with an impervious material or reinforced concrete and drained to a sump, then routed to fluid holding facilities or returned to the process circuit.

3) All fluid preinjection holding facilities should be above-ground tankage with adequate design strength and constructed of a material compatible with the injection fluid.

4) Process fluids or emergency storage facilities should be above-ground vessels or artificially lined ponds with adequate design strength and constructed of a compatible material. If lined ponds are used, they shall have a leak detection system installed.

5) Ponds used for emergency storage during well maintenance or workover will not be used for any other purpose.

11. Other subsurface operations in the area:

a. Discussion of other injection or mining operations in the area, including names, distance from the proposed well, and the injection interval or mining interval.

b. Hydrologic implications of proposed well as related to the existing operations.

12. Injection well operation:

a. Expected maximum and average injection pressures.

b. Calculated changes in reservoir pressures, formation fluid displacement, and direction(s) of dispersion of injected fluids.

c. Describe provisions for continuous activities necessary for proper well maintenance and operation, and qualifications of personnel who will operate and supervise the

injection well and related facilities.

d. Contingency plan and description of facilities to cope with well failures or shut-in (Emergency Response Plan).

Note: A mechanical integrity testing plan and schedule may be required for certain types of Class V injection wells on a case-by-case basis.

13. Representative background ground water analyses for the receiving aquifer and all USDW's in the area of review shall be provided from locations adjacent to and hydraulically down-gradient and up-gradient from the proposed injection well(s). The analyses shall include all parameters listed in the state Drinking Water Standards and Ground Water Quality Standards, and any additional parameter(s) of concern reasonably expected to be present in the injectate.

14. Plans (including maps) for meeting the following monitoring requirements:

a. Monitoring wells shall be completed into the injection zone and into any USDW above or below the injection zone. Properly completed existing water wells may be utilized in meeting this requirement.*

Monitoring wells shall be completed in such locations hydraulically down-gradient from the injection well(s) as to detect the migration of injectate contaminants, injectate reaction products or formation fluids towards points of withdrawal or natural seepage (springs) of ground water.*

b. Monitoring of ground water shall include, at a minimum, all State Drinking Water Standards, all State Ground Water Quality Standards and any additional parameters reasonably expected to be present in the injectate. Baseline analyses for these parameters shall be completed at all monitoring wells noted in (a) and submitted to the Division of Water Quality prior to injection well start-up. Indicate the proposed monitoring frequency.*

c. Indicate the proposed parameters of injectate monitoring, to include at a minimum those noted in (b) above as well as injection pressure, volume and flow rate. Indicate the proposed frequency of injectate monitoring.

* NOTE: Ground water monitoring may not be required in all cases.

15. Proposed Well Plugging Abandonment Plan in the event of well failure or upon expiration of the project.

16. A certificate indicating that the applicant has assured, through a performance bond or other appropriate means, the resources necessary to close, plug, and abandon the wells. Include all calculations and results of all calculations used in determining the financial resources required.

ARTIFICIAL PENETRATION REVIEW

Well (etc.) I.D. _____

Control: _____ Status: _____

Operator: _____ State Forms: _____

Lease: _____ Distance from Injection Well: _____

Plugging Details Well Diagram

POTENTIAL PROBLEM(S):